

# PATENT ABSTRACTS OF JAPAN

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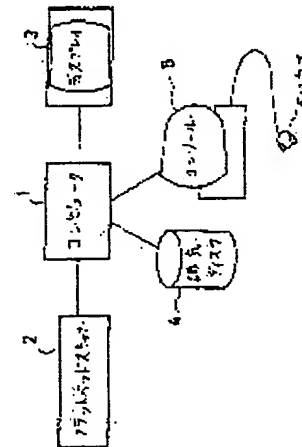
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## (54) SIMPLIFIED DIGITAL STILL PICTURE INPUT DEVICE PROVIDED WITH DENSITY RANGE CONVERTING FUNCTION

### (57)Abstract:

**PURPOSE:** To obtain image data by enlarging a virtual density range by obtaining a rough image by prescanning a film, obtaining a picture pattern input position and size by a regular scan, and also, using a density range conversion table.

**CONSTITUTION:** A display 3 is provided with a frame memory so as to display a color image, can display simultaneously line information of a trimming frame by superposing it on an image which has been inputted and displayed, and also, the density range width is derived from the image data in the trimming frame. This trimming frame is inputted by a pointing device such as a mouse 6 and a digitizer, etc., in accordance with a necessary picture pattern. By utilizing a graph for showing a relation of the density of the picture pattern at the time of prescan and an internal value (magnitude of a signal), a new density conversion table for enlarging the width of a virtual density range is derived.



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TITLE OF THE INVENTION  
SIMPLIFIED DIGITAL STILL IMAGE INPUT DEVICE COMPRISING  
DENSITY RANGE CONVERTING FUNCTION

Abstract: PURPOSE: To obtain image data by enlarging a virtual density range by obtaining a rough image by prescanning a film, obtaining a picture pattern input position and size by a regular scan, and also, using a density range conversion table.

CONSTITUTION: A display 3 is provided with a frame memory so as to display a color image, can display simultaneously line information of a trimming frame by superposing it on an image which has been inputted and displayed, and also, the density range width is derived from the image data in the trimming frame. This trimming frame is inputted by a pointing device such as a mouse 6 and a digitizer, etc., in accordance with a necessary picture pattern. By utilizing a graph for showing a relation of the density of the picture pattern at the time of prescan and an internal value (magnitude of a signal), a new density conversion table for enlarging the width of a virtual density range is derived.

WHAT IS CLAIMED IS:

1. A simple digital still image input device comprising density range converter ability wherein an appointed domain is scanned, and image data is taken in, busy image data is memorized, in simple digital still image input device to display, means pre-scan does appointed within the limit with predetermined resolution, and to take image data in of object pictorial image, means to set input size, a trimming frame as

against busy image data, means to calculate a trimming position, resolution based on set input size, density range is pursued from image data in a trimming frame, and density conversion table implementation means to magnify density range is comprised, calculated trimming position, resolution and set input size are based on, because a book scans trimming within the limit, capture of image data is done and, it is characteristic of that density range is magnified in an appearance by made density conversion table.

#### DETAILED DESCRIPTION OF THE INVENTION

##### [Industrial Application Field]

The present invention relates to facility digital still image input device comprising density range converter ability to input digital still image into an optical storage medium represented by CD-ROM including pictorial image, CD-I.

##### [Prior Art]

What use camera as input device of digital pictorial image to display to a display conventionally is common,

In pictorial image input by such a camera, an empty - manuscript is put in the manuscript level,

Optics, a position, size are put together, and part of the pattern that it is necessary is input.

Problems which should be solved by invention

However, in pictorial image input by camera, high resolution, correct registration, right writing and correct focus doubling are difficult,

It is difficult to get case for highly precise image Medea, enough pictorial image of accuracy.

The present invention is a thing to solve the problems,  
An input position, dimension doubling are simple and easy and,  
The image data which widened density range in an appearance  
can be got,

It is aimed at providing simple digital still image input  
device comprising density range converter ability.

[means to solve problems]

To do so, simple digital still image input device comprising  
density range converter ability of the present invention scans  
appointed region, and image data is taken,

Busy image data is memorized,

In simple digital still image input device to display,

Means pre-scan does appointed within the limit with  
predetermined resolution, and to take image data in of object  
pictorial image,

Means to set input size, a trimming frame as against busy image  
data,

Means to calculate a trimming position, resolution based on  
set input size,

Density range is pursued from image data in a trimming frame  
and,

Density conversion table implementation means to magnify  
density range is comprised,

Calculated trimming position, resolution and set input size  
are based on,

Because a book scans trimming within the limit, capture of  
image data is done and,

It is characteristic of that density range is magnified in  
an appearance by made density conversion table.

[Operations]

In the equipment which inputs digital still image to use into the optical storage medium that digital still image input device is represented temporarily by CD-ROM including pictorial image, CD -1 of the present invention,

By at first doing pre-scan of a color film,  
Rough pictorial image is got, and it is displayed to a display,  
A necessary trimming size trimming position is indicated on pictorial image,

It is simple and easy, and a capture position of a correct pattern, size are got by a trimming position, resolution are calculated, and scanning a book again and,

A density range is opened in an appearance by density range conversion table, and image data can be got.

[Examples]

Example is explained when taken with the drawing as follows.  
Figure 1 is a diagram of standing on its dignity by contour configuration of digital still image input device temporarily,  
Figure 2 is a diagram of standing on its dignity in the manuscript level,

Figure 3 is a diagram of standing on its dignity with a transmission color film holder,

The same diagram of (a) is perspective view,

The same diagram of (b) 351 is a diagram of standing on its dignity in electrode holder - of size,

The same diagram of (c) is a diagram of standing on its dignity with a holder of 5X7cm size,

Figure 4 is film size and resolution, and it is a diagram of to show a relationship with scan size in,

Computer, 2 are flatbed scanner 1 out of a diagram of,

3 is a display,

4 is a magnetic disk,

5 is a console,

6 is a mouse,

11 is the manuscript level,

A baseline vertical 12,

A baseline horizontal 13,

A color film holder transmitting 21,

22 is a film,

23 is frame Line.

In the drawings, flatbed scanner 2 omits delineation,  
CCD image sensor is installed in light source, the main frame  
inside in upper part,

Because the manuscript level moves between them, image data  
of a film put in manuscript objective is taken in line  
sequential.

The visible radiation that transmitted with a film, it is done  
spectral in each B component R, G by dichroic mirror,

Each CCD image sensor is arrived at.

R, G, each B signal are output at the same time by each image  
sensor, for example, is read to computer 1 comprising  
microcomputer, and is stored to magnetic disk 4.

Memorized image data can be displayed to display 3 if  
necessary,

Further a trimming frame is set with optional dimension in  
an optional position using mouse 6 from console 5,

It is put on a display image, and a trimming frame gets possible  
to be displayed.

Baseline 12 specifying a position of far right edge of a film  
in a top face of manuscript level 11 long,

Baseline 13 specifying a position of upper limit of a film

wide is carved with.

Further transmission color film holder 21 is matched with size of film as shown in figure 4, and it becomes choose,

Frame Line 23 depending on size of film is chopped.

Film 22 sandwiches between transmission color film holder 21 of size to fall under, and enter,

It is put to flat on manuscript level 11 of rad scanner 1.

It was ticked away to baseline 12 carved with to manuscript level 11 then long and baseline 13 wide and transmission color film holder 21,

It is put so that far left edge of frame Line 23 and the upper end accord.

And this frame vA23 can leave pre-scan, and it is displayed to display 3.

Image data input of one embodiment of the invention is explained by figure 5-figure 7 next.

Figure 5 has a diagram of standing on its dignity with a display image on a display unit,

Figure 6 is a diagram of standing on its dignity in density conversion table,

Figure 7 is a diagram of standing on its dignity in processing flow.

In a diagram of, 31 is screen,

32 is a film image,

33, a pattern,

34 is a trimming frame.

In accordance with exemplary embodiments, the picture element number which display 3 can display assumes 512 pixels, 512 pixels of side long.

This display unit 3 has a frame memory to display color image,



(not shown),

Further input table is put on shown pictorial image, and line information of trimming frame 34 can be displayed at the same time,

And spreading of density range becomes demand by image data in trimming frame 34.

This trimming frame 34 accepts pattern 33 to need and,

With a pointing device such as mouse 6 and a digitizer, operator inputs.

A step is chased, and a method to input a pattern is really explained using simple digital still image input device of the present invention next.

As input condition, raw material does eight cho recorded on a 35n transmission color film long, a pattern of side 12m, input size with 00 pixels of authorities of length, 600 pixels of side.

At first film 22 is set to 35mm transmission color film holder 21,

(a figure 7 step)

Frame Line 23 of electrode holder - is matched with a baseline of manuscript level 11 (a figure 7 step).

As shown in figure 4, next 51.2nX51.2mm dimension of frame 23 chopped to transmission color film electrode holder -21 then,

It should input in ten pixels of resolution / \*\* to display all picture element in a frame to 512 pixels, 512 pixels of displays long wide.

This relationship is memorized in computer 1 beforehand, this data is handed to scanner control part.

And by doing pre-scan of electrode holder - within the limit,

Pictorial image in a frame is taken in, and it is always displayed by a display (a figure 7 step).

This pre-scan work is a thing to demand a trimming position of a pattern, resolution, spreading of density range,

As shown in figure 5 (a), the pictorial image which was busy in pre-scan is displayed to display 3.

Among pictorial image displayed next, pattern 33 to fall under should be cut and brought down in 00 pixels of authorities of length, 600 pixels of frames wide,

Trimming frame 34 which is 400:600 ratio is repeated in pictorial image displayed as shown in figure 5 (b), and it is displayed.

And by making this trimming frame Line 34 is moved by means of mouse 6, and do variable power,

33 parts of patterns  $\delta$  ko to fall under as shown in figure 5 (c) makes it be equal to (a figure 7 step).

It is condition of figure 4 (c) that a trimming frame and a pattern were equal to,

It makes migration of trimming frame Line 34, variable power finish,

Coordinates (X0,., yo) on the right of trimming frame 34 and picture element number Lx Ly of length and breadth of a trimming frame are demanded and,

It is apertures picture element number for density range measurement shown in figure 6,

Spreading of density range, that is to say greatest temperature DMAX, minimum density are demanded as against image data in trimming frame 34

(a figure 7 step).

Capture size calculates a position of a trimming frame, picture

element number of length and breadth for 00 pixels of authorities of length, side 600 pixels as follows.

Scanning offset / side X.

/10 (mm) length Y.

/10 (\*) resolution / B-10 (picture element /mm) X600/Lx, further, spreading of density range, for example,, VMAX = MAX (MAX (Rt, G+, Bt)) VMIN = MIN (MIN (Rt, G+, B+)) i = 1-n (Rt, G+, Bt are interior value calculated in apa - chiya for density range measurement again.)

If it is substituted for  $D = - (v-261) / 87$ , is demanded.

Coordinates (scanning off cent) (X, 11.YO) on the right of the trimming frame which  $DMAX - (VMIN-261) / 87$   $DMIN - (V, Ax-261) / 87$  does it this way, and was provided extends,

By ten capture resolution pictorial image /Im in picture element number Lx of length and breadth of a trimming frame, Ly and pre-scan,

This scan start point, resolution when it is scanned are calculated (a figure 7 step).

Further using graph to show density of a pattern in pre-scan shown in figure 6 and a relationship with interior value in,

An appearance demands new density conversion table to enlarge spreading of upper density range

(a figure 7 step).

Gray level, a vertical scale cope with interior value (dimension of signal) a horizontal scale in digital display vs. a piece figure 6,

A is label f \$ density conversion te - bull, and interior value 255-0 (eight bitsutodeta) are set as against density 0.07-3.0 by \* gills ruyou.

And than density range DWAX in the trimming frames bought as

described before and D □ 9,

V, 41H and VIIIX are pursued respectively,

When the value is converted into 255-0, and it supposes with new density conversion te - bull B,

An appearance can widen the top in density range.

By getting image data when taken in conjunction with this table,

Density in a trimming frame makes clear more, preferable pictorial image of accuracy can be got.

By doing this scan in this way (a figure 7 step),

As shown in figure 5 (d), it is input in size needing 33 appointed pattern part,

And density range can get image data of wide gatsuta high accuracy in an appearance.

In addition, the picture element number which a display could display did with 512 pixels, 512 pixels of side long in the example, but,

Length and the lateral picture element number which can be displayed are i natsutemoyoi.

Further it was become in the shape of straight line in density conversion table, but,

This is done to the letter of a contour, and particular density part is emphasized, and it may be weakened,

Further density conversion should be done if necessary, it goes enough without saying that it needs not to be always done when density spreading is provided.

[Effects of the Invention]

In using flatbed scanner as input device according to the present invention as above,

Resolution, registration, riding, a problem of focus doubling

are solved,

Besides, it is simple and easy, and an input position, dimension doubling can be done and, particularly, case for a color film,

For example,, as against 35m, 6X6 (cm), 6X7 (  $\sigma$  ), a clairvoyance color film of size of 4X5 (an inch),

A density range is opened in an appearance by density range replacement table, and image data can be got.

#### BRIEF DESCRIPTION OF DRAWINGS

A diagram of that figure 1 shows contour configuration of digital still image input device temporarily,

A diagram of that figure 2 shows the manuscript level,

Figure 3 is a diagram of standing on its dignity in transmission color film electrode holder - ,

The same diagram of (a) is a diagram of that perspective view, figure above (b) stand on their dignity in electrode holder - of 35fl size,

The same diagram of (c) is a diagram of standing on its dignity in electrode holder - of 5X7cm size,

Figure 4 is a diagram of to show film size and resolution, a relationship with scan size in,

Figure 5 is a diagram of standing on its dignity with a display image on a display,

Figure 6 is a diagram of standing on its dignity in density conversion table,

Figure 7 is a diagram of standing on its dignity in processing flow.

1... computers,

2... flatbed scanner,

3... display units,  
4... magnetic disks,  
5... console,  
6... mice,  
11... manuscripts level,  
12... length baselines,  
13... side baselines,  
21... transmission color film holders,  
22... film,  
In 23... frame diagrams,  
31... screen,  
32... film pictorial image,  
33... patterns,  
34... trimming frames.

An applicant

Dai Nippon Printing

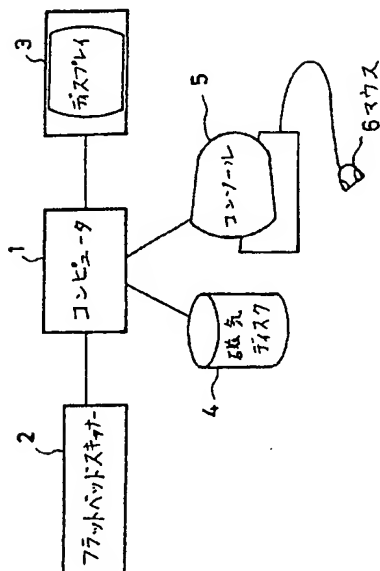
Attorney

A patent attorney

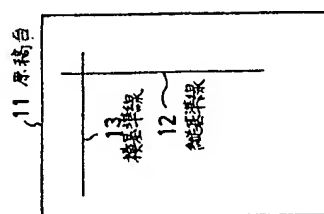
Masanobu Hirukawa

(two others)

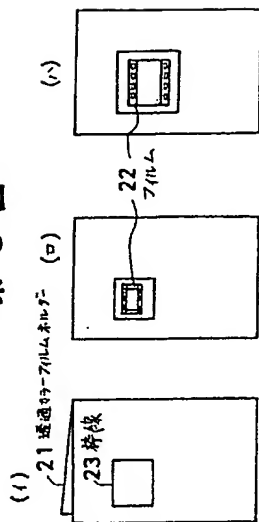
第 1 図



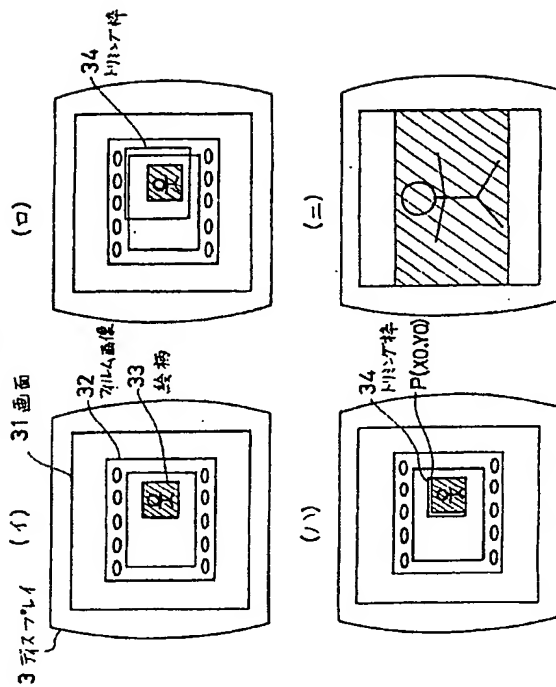
第 2 図



第 3 図



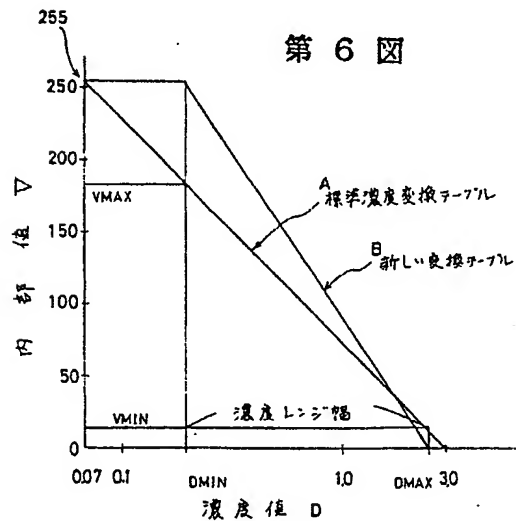
第 5 図



第 4 図

	プレスキャン 分解能	プレスキャン サイズ	濃度レンジ測定用 アパーチャ画素数
3.5mm用	10画素/mm	51.2m/m×51.2m/m	6画素×6画素
6×6用 6×7用	5画素/mm	102.4m/m×102.4m/m	3画素×3画素
4mm用	3画素/mm	170.7m/m×170.7m/m	3画素×3画素

第 6 図



第 7 図

- ① ホルダーにフィルムをセットする。
- ② 原稿台の基準線にホルダーの枠線を合わせる。
- ③ ホルダー枠内をプレスキャンして画像を取り込み取る。
- ④ トリミング枠を設定して絵柄に合わせる。
- ⑤ トリミング枠の位置・縦横の画素数・濃度レンジ幅を求める。
- ⑥ 本スキャンの開始画・分解能を計算する。
- ⑦ 新しい濃度変換テーブルを求める。
- ⑧ 取込みサイズ条件に合わせて本スキャンを行う。